

I claim:

- [c1] A method of safely transporting high-frequency signals over power transmission lines, comprising the steps of:
  - coupling and de-coupling high-frequency electrical signals on a first power transmission line;
  - converting said high-frequency electrical signals to light signals and light signals to said high-frequency electrical signals with an electro-optical transducer for coupling and de-coupling said high-frequency electrical signals to and from a non-electrically conductive but light conductive medium.
- [c2] The method of claim [c1], further comprising performing said steps within a non-electrically conductive enclosure.
- [c3] The method of claim [c1], wherein said light conductive medium is a fiber-optic isolator.
- [c4] The method of claim [c3], wherein said fiber-optic isolator is a fiber-optic transmission line.
- [c5] The method of claim [c3], further comprising transmitting said light signals to and from an interface device for digital appliances.
- [c6] The method of claim [c3], further comprising:
  - transmitting said light signals to and from a second electro-optical transducer to for coupling and de-coupling said high-frequency electrical signals to and from an opposite end of said fiber-optic isolator; and
  - coupling and de-coupling said high-frequency electrical signals on a second power transmission line;

so as to form an electrically isolated power line bridge.

[c7] An apparatus for safely transporting high-frequency signals over power transmission lines, comprising:

coupler means for coupling and de-coupling high-frequency electrical signals on a first power transmission line;

an electro-optical transducer capable of converting said high-frequency electrical signals to light signals and light signals to said high-frequency electrical signals; and

a non-electrically conductive but light conductive medium adjacent said transducer for coupling and de-coupling said light signals.

[c8] The apparatus of claim [c7], further comprising a non-electrically conductive enclosure for at least said coupler means and said transducer.

[c9] The apparatus of claim [c7], wherein said light conductive medium comprises a fiber-optic isolator.

[c10] The apparatus of claim [c9], wherein said fiber-optic isolator is a fiber-optic transmission line.

[c11] The apparatus of claim [c9], further comprising an interface device for digital appliances connected to an opposite end of said fiber-optic isolator.

[c12] The apparatus of claim [c9], further comprising:

a second electro-optical transducer connected to an opposite end of said fiber-optic isolator for coupling and de-coupling said high-frequency electrical signals and said light signals to and from an opposite end of said fiber-optic isolator; and

a second coupling means for coupling and de-coupling said high-

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frequency electrical signals on a second power transmission line so as to form an electrically isolated power line bridge.

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